

C. Remarks

The claims are 1, 7, and 9, with claims 1 and 9 being independent. Reconsideration of the present claims is expressly requested.

Claims 1, 7, and 9 stand rejected under 35 U.S.C. § 103(a) as being allegedly obvious in view of the allegedly admitted prior art on page 6, line 22, through page 8, line 25, as exemplified by JP 6-27302 and JP 8-258051. The grounds of rejection are respectfully traversed.

The Examiner has alleged that what is shown in Figs. 1A-1D and 2 is merely a depiction of what happens in the prior art processes disclosed in JP 6-27302 and JP 8-258051 and that the disclosure at page 7, line 7, through page 8 is Applicants' description of the prior art process. The Examiner alleged that the discussion in the specification at pages 7 and 8 in its entirety constitutes what was known in the art. To that end, the Examiner acknowledged that the prior art does not disclose the claimed opening diameter, but alleged that the claimed range would be optimizable based on the desired curvature radius to achieve the most expeditious formation of the microlens mold. Applicants respectfully disagree.

In order to optimize the opening diameter as alleged by the Examiner, this diameter must first be recognized as a result-effective variable (MPEP 2144.05; *In re Antonie*, 559 F.2d 618 (C.C.P.A. 1977) (the prior art did not recognize that treatment capacity is a function of the tank volume to contractor ratio and, therefore, the parameter optimized was not recognized in the art to be a result-effective variable)). JP 6-27302 and JP 8-258051, which are mentioned in the present specification, disclose electroplating over an opening in an insulating layer to form a mold for a lens. However, Applicants

respectfully submit that neither of these documents discloses or suggests that the diameter of the opening affects the expeditiousness of the mold formation process. Thus, the Examiner's allegation of optimization based on expeditiousness cannot be supported.

Furthermore, even if assumed, *arguendo*, that the prior art suggested varying the opening diameter for some reason, the Board of Patent Appeals and Interferences has recently reiterated that "[o]ptimization of a known result-effective variable in a given range is generally obvious . . . only when it is reasonably expected that an improvement will arise in that range." *Ex parte Atkinson and Benedict*, BPAI Appeal No. 2007-3900 (December 18, 2007) (emphasis added). Applicants respectfully submit that this reasonable expectation is not found in the prior art.

Applicants have investigated various prior art processes and discovered problems associated with these processes, as discussed in the specification on pages 7 and 8. The recognition of these problems by Applicants cannot be deemed as knowledge or information available in or as prior art, i.e., the discussion in the specification at pages 7 and 8 in its entirety does not constitute what was known in the art. In fact, a recognition of a prior art problem and a proposal for its solution often serves as the basis for a patentable invention. Stated differently, if prior art fails to recognize a problem, it cannot disclose or suggestion a solution to this problem. As the Examiner correctly noted, the prior art process merely represents the starting point for the instant invention.

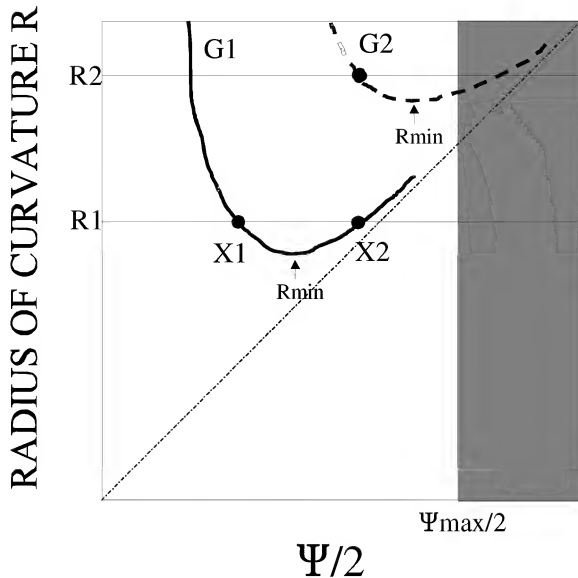
In any event, when the opening diameter  $\phi$  is large, an opening can be formed in a mask layer faster, more easily and, therefore, more cost effectively, with the increased flexibility of processing. Applicants have discovered, however, that if the opening diameter is too large, R becomes larger than the bottom radius  $\psi/2$ , and the desired

radius of curvature cannot be obtained. Applicants solved this previously unrecognized problem by setting the diameter of the opening within  $0.35R$ , depending on the radius, i.e., Applicants have determined that the opening value of  $0.35R$ , depending on the radius, is a critical parameter. As a matter of law, criticality of a parameter overcomes the presumption that a particular range is optimizable by routine experimentation (M.P.E.P. 2144.05).

When  $\phi$  is less than  $10\text{ }\mu\text{m}$ , a plated layer is semispherical from the onset of the electroplating process, and its radius of curvature steadily increases. Thus, it is possible to obtain a mold having a desired radius of curvature  $R$ . However, as noted above, this type of mold formation leads to a lengthy process.

Furthermore, the Examiner's attention is again directed to step (e) in claims 1 and 9. Specifically, the claims require that electroplating be terminated only when the electroplated layer reaches the desired radius ( $R$ ) of the curvature after forming a minimum radius ( $R_{\min}$ ) of curvature. As shown in attached Fig. A below, the curvature radius reaches the desired value  $R_1$  twice during the electroplating process (points X1 and X2).

Fig. A:



When  $R_1$  is initially reached, however, a radius  $\psi/2$  of the bottom of the plated layer is small compared with  $R$ . As a result, a dark lens is produced. By terminating the electroplating step after  $R_{\min}$  is reached, a lens is formed in which  $\psi/2$  is almost equal to  $R$ , i.e., a semispherical and clear lens. There is no disclose or suggestion in the art to continue electroplating past point  $X_1$  onto point  $X_2$  through  $R_{\min}$ . In fact, Applicants respectfully submit that the entire concept of  $R_{\min}$  is not disclosed or suggested.

Finally, the Examiner alleged that the claimed range works only for certain radii of curvatures and, for example, that a microlens with a radius of curvature of less than 28 microns could not be made by the presently described process, because it would require an opening of 9.8 microns. Applicants submit that the present claims recite a range for the diameter or width of the opening in the mask layer such that this opening should not be less than 10  $\mu\text{m}$  or more than 0.35R, depending on the radius. Setting the opening diameter to 10 microns should not prevent a 28 micron or smaller microlens from forming.

In sum, Applicants respectfully submit that the prior art fails to disclose or suggest electroplating through the formation of  $R_{\min}$ , the presently claimed opening range, the result-effectiveness of the opening diameter, and the criticality of the diameter of the opening being within 0.35R, depending on the radius. Thus, the presently claimed invention is clearly patentable over prior art.

For at least the reasons discussed above, Applicants respectfully request that the rejection under 35 U.S.C. § 103(a) be withdrawn. Wherefore, allowance of the claims and expedient passage to issue are respectfully requested.

Applicants' undersigned attorney may be reached in our New York office by telephone at (212) 218-2100. All correspondence should continue to be directed to our address given below.

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